# Multiple Animal Scale Mobile

# Installation/Service Manual

RICE LAKE
WEIGHING SYSTEMS
To be the best by every measure®

132051 Rev E

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*Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at* ***www.ricelake.com/training*** *or obtained by calling 715-234-9171 and asking for the training department.*


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*Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit www.ricelake.com/webinars.*

# 1.0 Introduction

Congratulations on your purchase of a *Multiple Animal Scale Mobile* (*MAS-M*) using On-Board technology. This system is manufactured with top quality components and is engineered using the latest technology to provide operating features and reliability unmatched for years to come.

Please take the time to read this manual completely through before attempting to use the system. Although the *MAS-M* has been designed for easy set up and use, a thorough understanding of this manual will ensure that you receive the maximum benefit from the system.

If you have any questions or comments please contact *Rice Lake Weighing Systems*.

## 1.1 Safety

**Safety Symbol Definitions:**

*Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.*

*Indicates a potentially hazardous situation that, if not avoided could result in death or serious injury, and includes hazards that are exposed when guards are removed.*

*Indicates a potentially hazardous situation that, if not avoided may result in minor or moderate injury.*

*Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.*

### General Safety

*Do not operate or work on this equipment unless you have read and understand the instructions and warnings in this Manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing System dealer for replacement manuals. Proper care is your responsibility.*

*Failure to heed may result in serious injury of death.*

*DO NOT allow minors (children) or inexperienced persons to operate this unit.*

*DO NOT operate without all shields and guards in place.*

*DO NOT jump up and down on the scale.*

*DO NOT use for purposes other than weighing.*

*DO NOT place fingers into slots or possible pinch points.*

*DO NOT place hands, feet or any body part underneath the scale at any time. The scale could be lowered at any time, crushing body parts.*

*DO NOT use any load bearing component that is worn beyond 5% of the original dimension.*

*DO NOT use this product if any of the components are cracked.*

*DO NOT exceed the rated load limit of the unit.*

*DO NOT make alterations or modifications to the unit.*

*DO NOT remove or obscure warning labels.*

*Keep hands, feet and loose clothing away from moving parts.*

*Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.*

*Always be certain when lowering the scale that everyone is clear of the scale and any moving parts.*

*Use two hands when gripping the lift handle to raise or lower the scale.*

*Be sure the gates are latched or tied inward before transporting the scale.*

*Ensure all three hitch lock pins are installed and the suspension stops are in the transport position before moving the scale.*

*This unit is not intended for the transportation of livestock or any other goods. Any addition of weight to the scale in transport mode may cause premature component failure and voids the Rice Lake warranty.*

## *Animal Safety:*

*Animal safety is a very serious issue and must be observed when handling any type of animal.*

*The scale surface may become slippery during use; a build-up of manure on the scale may reduce traction. It is recommended that you take any necessary precautions to maintain an acceptable level of animal footing.*

## *Calibration:*

*Do not calibrate this scale with a weight cart having a gross weight in excess of 4,000 lbs or 1,815 kg. This device is designed to be calibrated with single block weights spread evenly throughout the floor of the scale. Shift tests should not be done with more than 4,000 lbs or 1,815 kg in a 4' x 4' area. Failure to comply with this warning will result in damage to the scale and void the warranty.*

***Items 1-4 are on units equiped with the 920i Weighcenter only.***

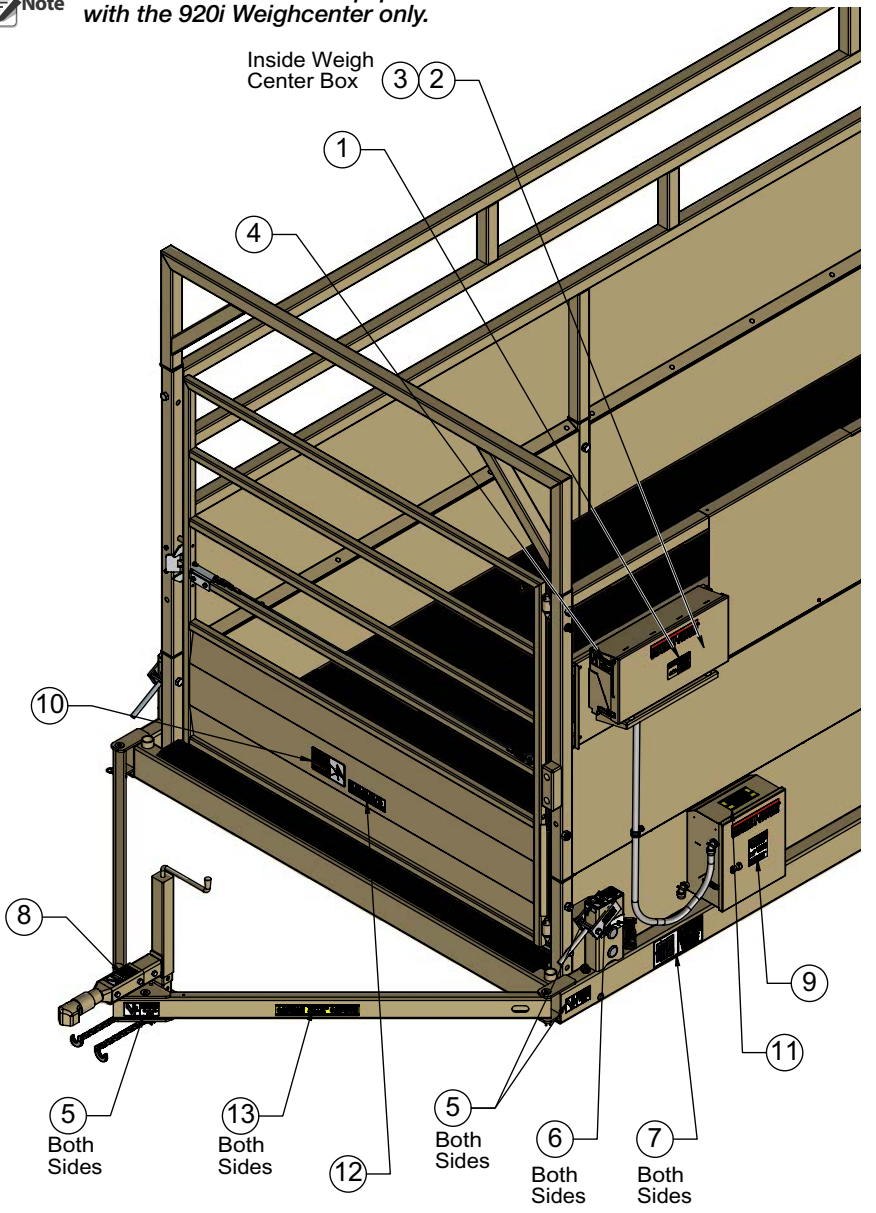



*Figure 1-1. Safety Decal Locations*

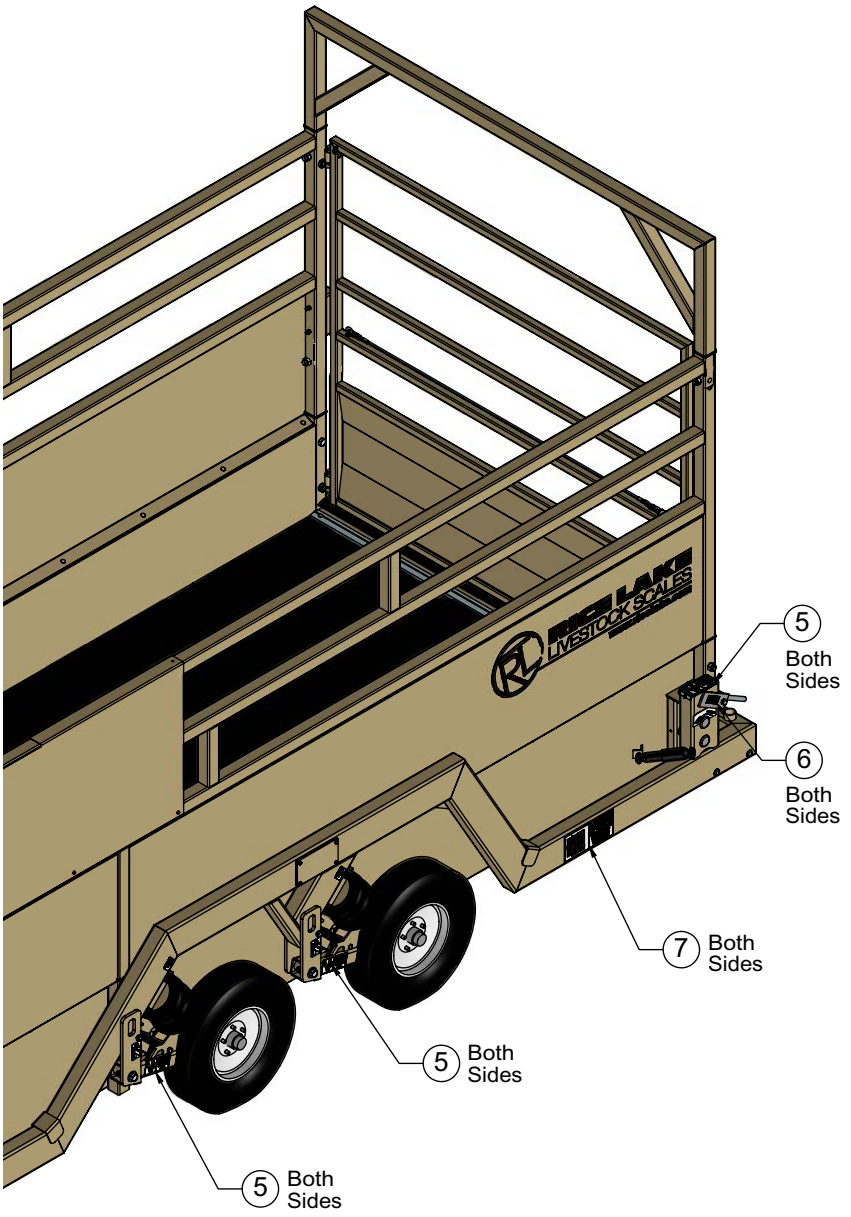



*Figure 1-2. Safety Decal Locations*

*Figure 1-3. Safety Decals*

| Item # | Part # | Description | Qty |
|---|---|---|---|
| 1 | 151908 | Read Manual | 1 |
| 2 | 151906 | Warning, Do Not Open | 1 |
| 3 | 151907 | Warning, Do Not Leave Tray Down | 2 |
| 4 | 151904 | Caution, Low Clearance | 1 |
| 5 | 151909 | Caution, Pinch Point | 6 |
| 6 | 151910 | Caution, Always Grip With Two Hands | 4 |
| 7 | 151898 | Warning, Crushing Hazard | 4 |
| 8 | 151905 | Warning, Crushing Hazard, Jack | 1 |
| 9 | 151900 | Warning, Battery | 1 |
| 10 | 151902 | Warning, Opens Quickly | 2 |
| 11 | 151901 | Caution, Not A Step | 1 |
| 12 | 128266 | Do Not Use For Transportation of Goods | 2 |
| 13 | 151987 | Caution, Tripping Hazard | 2 |

## 1.2 Overview

The *MAS-M* is an agricultural implement consisting of a scale with air ride suspension and swing out hitch, sheeted animal cage suspended by four S-type load cells through a cam style On-Board scale system, and weigh center. In transport mode the scale system is locked down, protecting the load cells from damage during transport. To convert to weigh mode the entire scale is lowered to the ground, the hitch is split and swung outward and the scale is raised to the weigh mode using a lever and cam system. The weigh center contains the digital indicator and ticket printer. To convert back to transport mode the process is reversed (lower the scale, swing hitch inward and lock and raise the suspension using the integral air pump).

The *MAS-M* can be used on any firm surface up to 7% grade (4-degree slope) and has a low deck height (6”) for easy step in.

*Figure 1-4. Multiple Animal Scale Mobile*

## 1.3 Lifting Instructions

Lift the scale only in designated locations (see Figure 1-5). The scale may be lifted by forklift (ensuring the forks reach through both walls) or by 4 straps and a crane or loader. **Ensure the scale is in the transport mode** (locked down – see next section) when loading and transporting the scale.

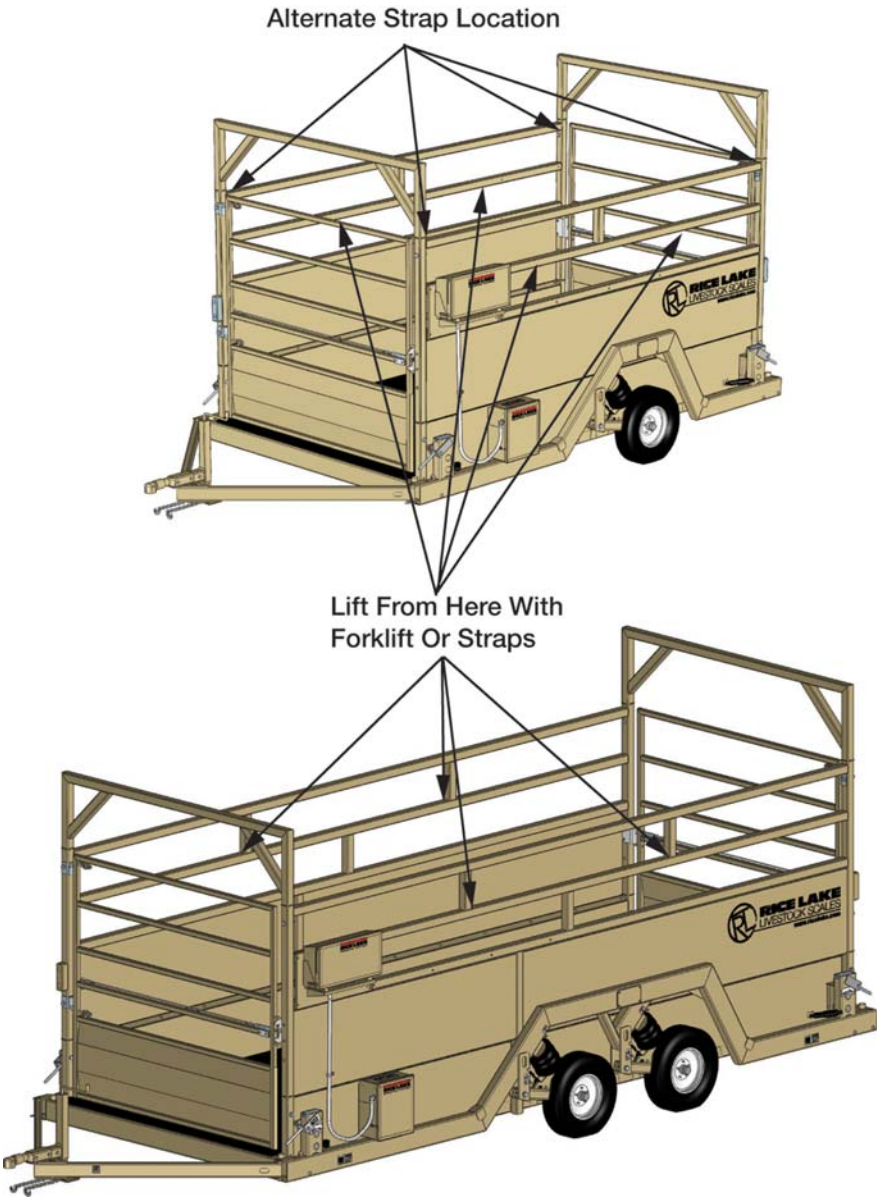



*Figure 1-5. Lift Points*

# 2.0 Assembly

## 2.1 Unloading

### 2.1.1 Install one lifting fixture on each of the four corners.

**Note** *If lifting fixtures are in place, skip to Section 2.1.2*

1. Remove the nylon locknut from the bolt installed for shipping.
2. Place the lifting fixture with small hole over the bolt.
3. Reinstall the nut leaving the fixture free to move.

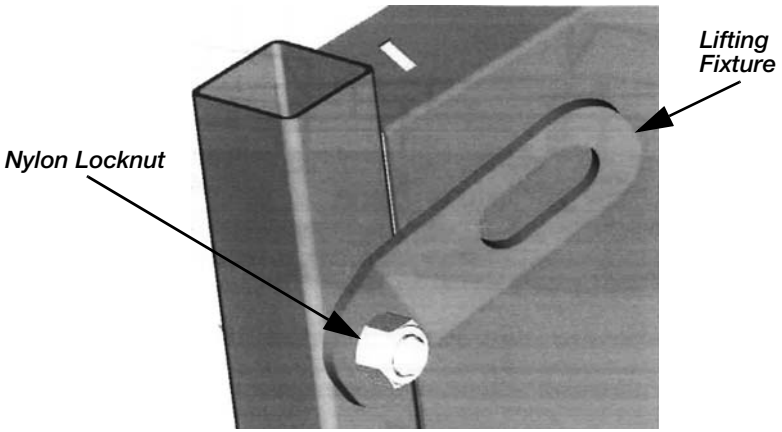



*Figure 2-1. Lifting Fixture*

### 2.1.2 Slinging the scale.

The *MAS-M* can be slung using 4 straps connected from the lifting lugs to a single point in the center. To obtain a lifting point closer to the center of gravity straps should be 1 to 2 ft longer on the rear of the scale. See Figure 2-2.

- Strap length 8 x 13 = 6 ft minimum
- Strap length 8 x 18 = 9 ft minimum

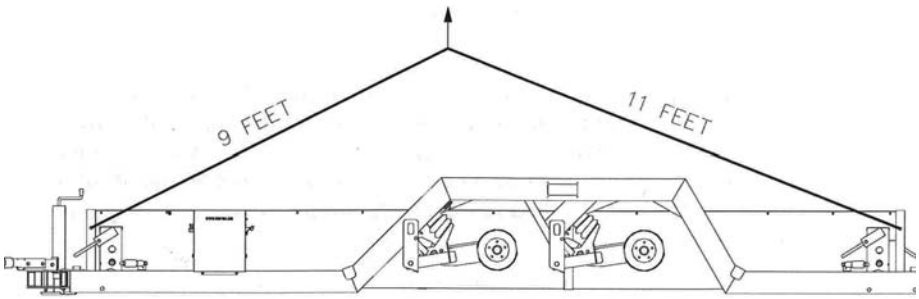



*Figure 2-2. Slinging the Scale*

### 2.1.3 Lift the scale.

1. If stacked, monitor the four corners directly below the lifting fixtures.
2. Each corner has a shipping stub inserted, these stubs are not bolted in place, ensure they remain with the lower scale.
3. Once the upper scale of the stack is removed the stubs can be discarded.

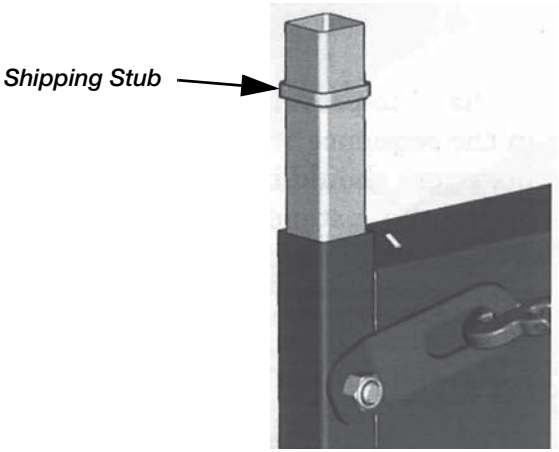



*Figure 2-3. Shipping Stub*

4. The scale can now be stored as is or placed on a relatively flat location to be assembled.

## 2.2 Package Removal

The indicator and tires are shrink wrapped for transportation. Be careful when removing to avoid damaging the indicator or tires when removing.

1. Remove the tires and indicator, then re-strap the walls if the scale is to be transported while packaged.

Note

***The bolt that holds the walls and the cross members in place during shipping is not used for assembly.***

***Please recycle the packaging material.***

***Place the parts safely and in a location they will not be damaged.***

### 2.2.1 Wheel Assembly and Torque Specification

It is extremely important to apply and maintain proper wheel mounting torque on the scale axle. Torque is a measure of the amount of tightening applied to a fastener (nut or bolt) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one-foot long will yield 90 ft-lbs of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied.

Note ***Wheel bolts/nuts must be tightened and maintained at the proper torque levels to prevent loose wheels, broken studs and possible dangerous separation of wheels from the axle. Be sure to use only the fasteners matched to the cone angle of the wheel (usually 60° or 90°).***

The proper procedure for attaching the wheels is as follows:

1. Start all bolts/nuts by hand to prevent cross threading.
2. Tighten bolts/nuts in the sequence shown in Figure 2-4.

Note ***The tightening of the fasteners should be done in stages, following the recommended sequence, tighten fasteners per torque chart in Table 2-1.***

3. Wheel bolts/nuts should be re-torqued after the first 10 miles, 25 miles and again at 50 miles.

| Wheel Torque Sequence (ft-lbs) | | |
|---|---|---|
| **1st Stage** | **2nd Stage** | **3rd Stage** |
| 20-25 | 50-60 | 90-120 |

*Table 2-1. Wheel Torque*

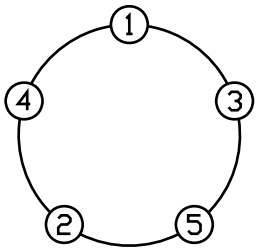



*Figure 2-4. Wheel Torque Pattern*

4. Once the wheel nuts have been torqued use a white marker to mark the end of each stud to show they have been torqued.

## 2.3 Cage Assembly

### 2.3.1 Apply the silicone bead

Before installing the walls a silicone bead must be added.

1. Clean the upper flange of the floor and the lower wall flange with mineral spirits.
2. Apply an 1/8” bead of silicone along the upper edge of the floor panel along the entire length as shown in Figure 2-5.

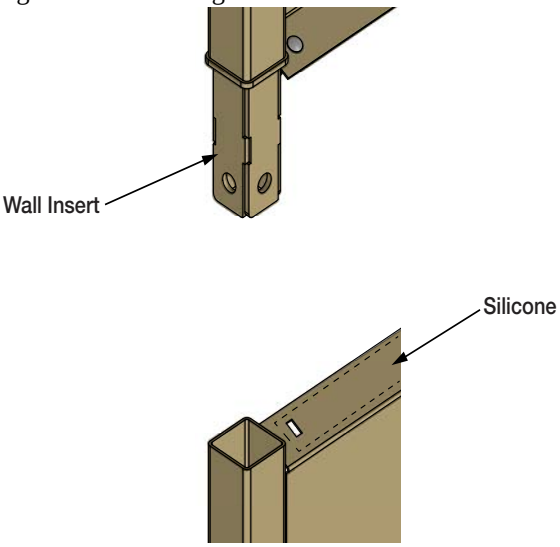



*Figure 2-5. Silicon Bead*

### 2.3.2 Install walls

**WARNING** ***Wall installation should be done with 2 people or an overhead crane.***

1. Lift the first wall by using one sling in the center.

**Note** ***The wall with the operator’s instructions is mounted on the left side.***

2. Stand the wall vertical and place the inserts from the wall into the tubes of the cage floor. The more vertical the wall the easier assembly will be.
3. Repeat for the opposite wall.
4. Install the top cross members.
5. Insert the 3/4 x 3 1/2” bolts through the cage wall and inserts on the indicator side of the cage, head of bolt to the inside.

**Note** ***A come-along from the top of the cross member to bottom of the cage corner post may be required.***
***For 18 ft scales a 1/2 x 3” bolt and nylon locknut is installed on the center post with the nut on the outside.***

## 2.3.3 Install the Gate

Note *Install the gate with the hinge bolts on the opposite side of the scale. Hook bolts must be assembled with lock washer on the inside of gate and the jam nut on the outside.*

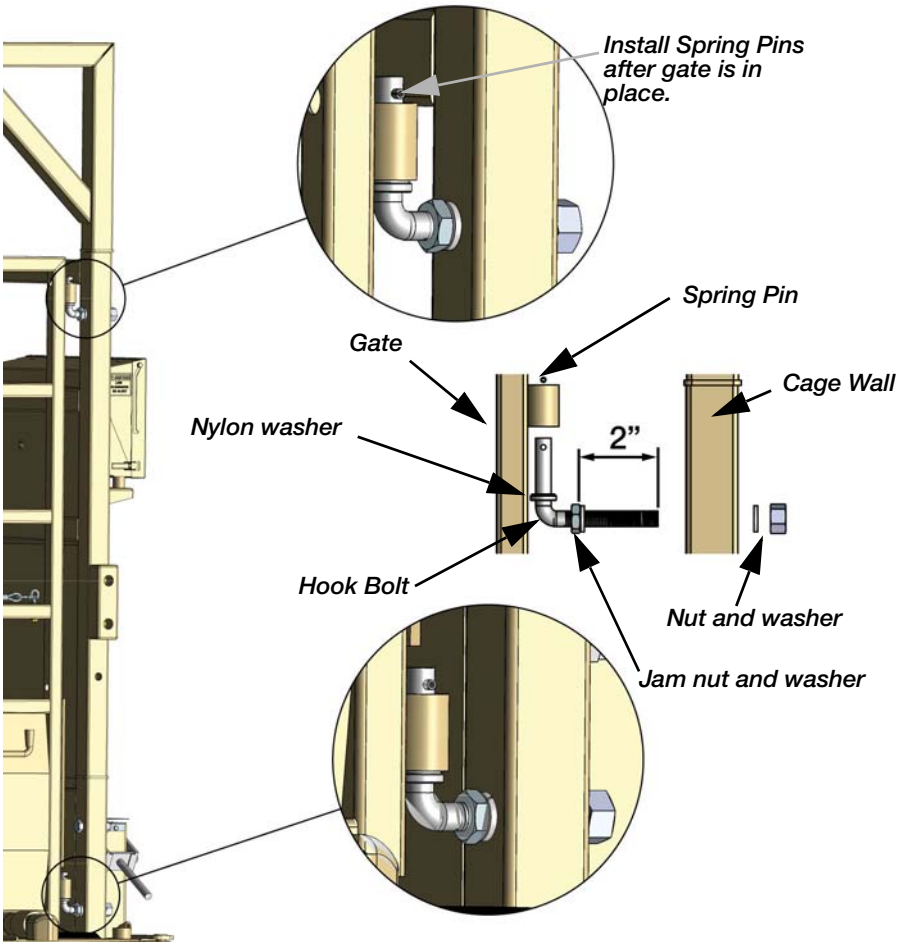



*Figure 2-6. Assemble Gate to Scale*

1. Install jam nut and lock washer onto the hook bolts. Screw the nut on about 2”.
2. Insert one hook bolt into the lower and upper holes of the cage wall with the hook portion pointing upward.
3. Install nut and washer onto the hook bolts securing them to the cage wall.
4. Place nylon washer onto the hook portion of the upper and lower hook bolts and install the gate onto the hooks.
5. Insert roll pin through the hook bolts.
6. Repeat steps 2-4 for second gate.
7. Adjust the hinge side gap between the gate and the cage wall to about 3” and snug hinge bolts.

### 2.3.4 Complete Cage Assembly

1. Install the 5/16” carriage bolts and serrated nuts with the head of the bolts on the inside of the cage. Begin by tightening the bolts from the center of the sheet section working outward.
2. Tighten the 3/4” x 3 1/2” bolts installed in Section 2.3.2.
3. Assemble the latch with 3/8 x 3 1/4” bolts, lock washers, nuts and the latch pin with the supplied hardware.

*Figure 2-7. Latch Assembly*

4. Install the 3/4” EVA hose on the latch pin (Mobile units only).
5. Adjust the gates and latches per the adjustment procedure.

## 2.4 Gate and Latch Adjustment Procedure

*The gates shall be assembled following the listed criteria:*

- *Hook Bolts - Assemble with lock washer on inside of gate and jam nut on the outside.*
- *Hinge Side Gap - Approximately 3" between the gate and the corner post.*
- *Gate Latch Pin - Install rubber tubing on the latch pin (Mobile units only).*

Adjust gates as follows:

1. Adjust the hook bolts to align the top of the gate on the latch side with the top of the cage wall.
2. Adjust the hook bolts so the latch side gap is about 1 1/2".
3. Install and adjust the latch so the gate latch pin does not rub on the top or bottom of the latch. Adjust the hook bolts only if necessary.

### 2.4.1 Hitch Assembly

1. If the hitch arm does not come mounted, assemble the right hitch member (with coupler) to the cage using the pin installed in the hole. Ensure the clip pin is installed on the bottom of the pin.
2. Connect the two halves of the hitch and install the forward pin through both left and right hitch members.
3. Install the safety chains as shown in Figure 2-8.

*Figure 2-8. Safety Chain*

4. Assemble jack, tighten bolts.
5. Install power cable and connect breakaway switch.
6. Connect the slip hook with the safety latch onto one end of each chain.
7. Install the quick link into the 4th link of the chain on the opposite end of the slip hook.
8. Insert the quick link into the bottom hole on the hitch mounting plate.

## 2.5 Optional 920i Weighcenter Mounting

1. Before installing the bracket a bead of silicone must be added. See Figure 2-9. (Apply silicone where labeled adhesive)
2. Clean the wall tubes where bracket will mount and the space between the holes on the mount bracket with mineral spirits.
3. Install the adhesive tape on the mounting bracket between the holes.
4. Place the mounting bracket onto the cage wall by pressing the adhesive tightly to the cage.
5. Secure with four bolts.

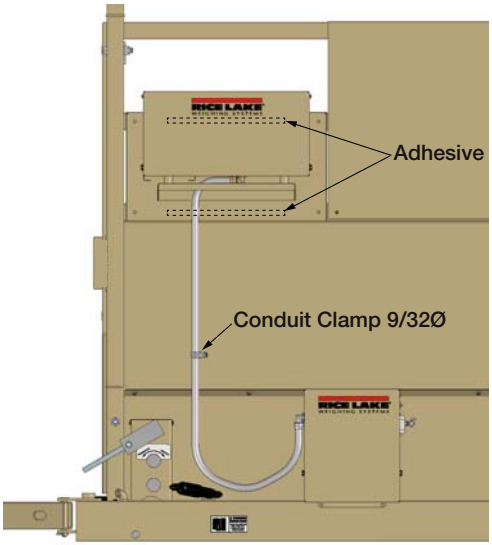



*Figure 2-9. Weighcenter Mounting*

6. Mount the weighcenter onto the mounting bracket and route the cable as shown in Figure 2-9.
7. Install the clamps to secure the conduit.
   - Mount the upper conduit clamp using the lower left mounting bracket bolt.
   - Secure the lower end of the conduit by drilling a hole through the cage sheeting and installing the clamp with the bolt provided.

### Battery Box Connections

1. Connect the scale cable and secure with a cable tie.
2. Connect the power wires as shown in Figure 2-10.
3. Replace the battery cover.

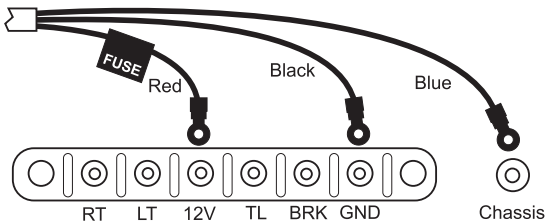



*Figure 2-10. Battery Connections*

## 2.6 T-Belt

Ensure the T-Belt hold down loops are installed and hooked into the corner posts of the cage.

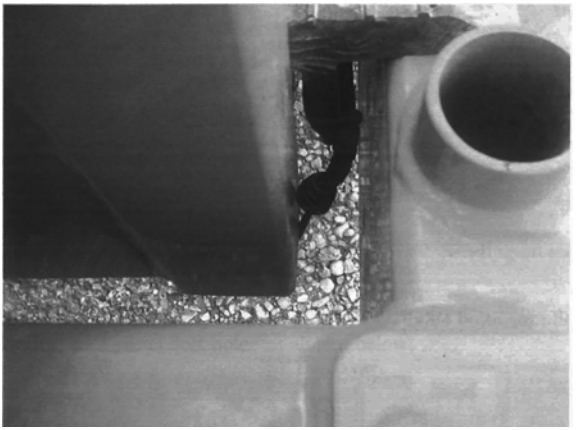


*Figure 2-11. T-Belt*

# 3.0 Towing Instructions

**WARNING**

***Read these instructions before towing.***

***This unit is not intended for the transportation of livestock or any other goods. Any addition of weight to the scale in transport mode may cause premature component failure and voids the Rice Lake warranty.***

The scale must be in "Transport Mode" to be towed. See Section 3.1.2 on page 22 for converting to transport mode.

The scale is designed to be towed level (frame parallel to the ground) using a 2" ball. To achieve the level towing condition, the required hitch height of the towing vehicle must be approximately 16". If the hitch of the towing vehicle is not in this range, use an adapter to achieve a height in this range. The hitch weight of the scale is approximately 500lb. An equalizer hitch may be used for towing if desired (such as the EAZ-LIFT Adjustable Weight Distributing Hitch #1009).

Safety chains must be connected during towing (see Figure 3-1). Connect the safety chains. Cross the chains under the hitch for proper protection. Safety chain length is adjustable by inserting the quick link through any link of the chain.

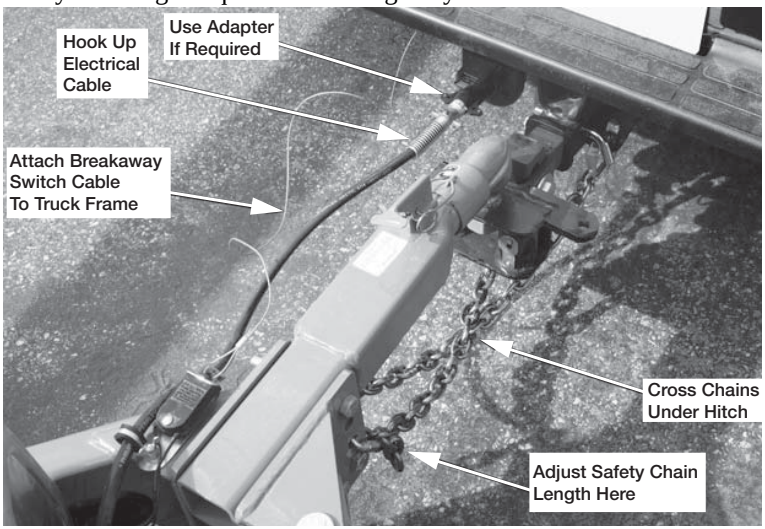

Hook Up Electrical Cable
Use Adapter If Required
Attach Breakaway Switch Cable To Truck Frame
Cross Chains Under Hitch
Adjust Safety Chain Length Here

*Figure 3-1. Hitch Connection*

The scale must be connected electrically to the tow vehicle. Ensure that the wiring of the towing vehicle is compatible with the scale wiring before hooking up. See the label on the hitch for the wiring code (or see Figure 5-9 for wiring diagram). The scale is supplied with a 7-pin connector. It is crucial the wiring is correct so the battery (which supplies power to the control box) is charged during transport.

**WARNING**

***Improper wiring can cause brake failure.***

If the scale is to be towed at night or if the lights of the tow vehicle are obstructed by the scale, add on lights are available. These lights plug into a 6-pin receptacle located on the rear of the battery box and attach magnetically to the scale frame.

The scale is equipped with electric brakes. **The brakes** must be synchronized with the tow vehicle brakes **before towing.** See Section 5.3.2 on page 32 for procedures. The breakaway switch for the electric brakes must be connected during towing. This switch activates the scale brakes in the unlikely event of scale separation from the tow vehicle. The metal cable must be attached to a point on the tow vehicle other than the primary connection point.

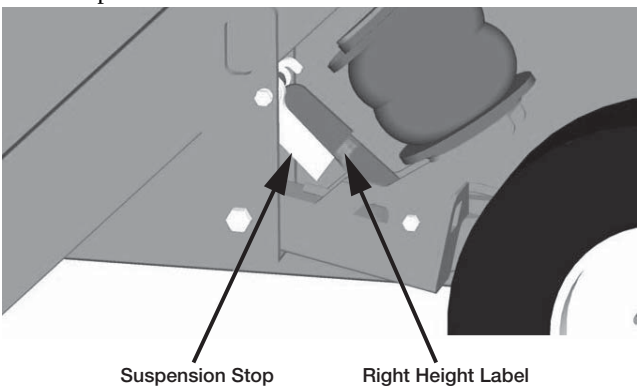



*Figure 3-2. Ride Height*

The scale is designed to be towed at a ride height of approximately 8 inches. A ride height label is attached to every shock absorber to visually confirm the ride height. After the scale is hooked up to the tow vehicle, check all the ride height labels to ensure proper air bag inflation. Add or remove air as necessary.

Suspension stops (one on each axle of the scale) are supplied to prevent the scale from dropping to the ground in the event of an air system failure. These stops must be in the transport position during towing.

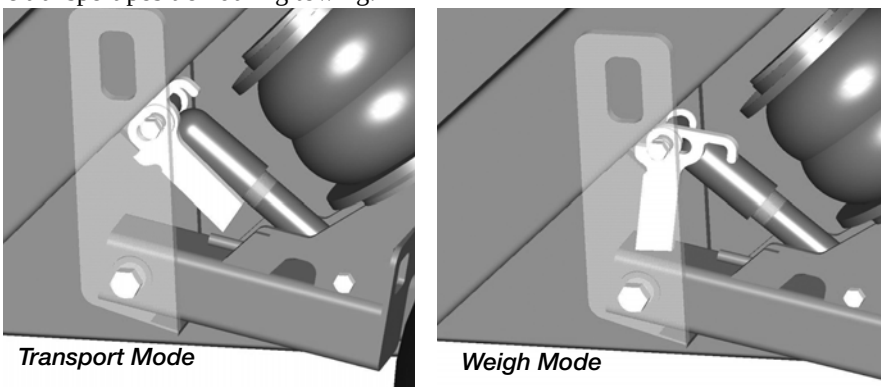



*Figure 3-3. Suspension Stop*

**WARNING**

***The Suspension Stops are not to be used as a means of transporting the scale. It is only to be used to as a safety device, allowing removal of the scale from the roadway in the event of an air system failure.***

# 3.1 Switching Between Modes

## 3.1.1 Converting to Weigh Mode

1. Park the scale in as level a location as possible. Ensure there are no obstructions under the deck that would affect weighing accuracy.

**Note** *The scale will weigh properly on a slope up to 4 degrees (approximately 7%).*

2. Turn the power switch located in the weigh center to the ON position.
3. If the scale is not level the indicator will display "**Out Of Level**" with the pitch and roll angle below, allowing the scale to be leveled.
4. With the drop leg retracted extend the jack until it begins lifting up on the scale hitch.
5. Disconnect the scale from the truck hitch and unplug all wiring. Move the truck clear of the scale.
6. Using the hitch jack, lower the scale hitch to the ground.
7. Flip the suspension stops (on each axle of the scale) into the weigh mode (see Figure 3-3). Scale will not fully lower to ground with stops in transport position.
8. Ensure the dump valve located on the battery box is closed and open all valves located directly above the air bags.
9. Slowly open the dump valve to empty the air from the scale suspension. The scale will lower to the ground.
10. Inspect all four corners of the scale. Although the scale will weigh properly up to four degrees off level, individual corners of the scale should not be allowed to teeter. If any of the corners are not contacting the ground, either move the scale to a more level location or do the following:
11. Close the dump valve and turn on the air pump to slightly raise the scale. Once the scale frame has lifted sufficiently, turn off the pump.

**Note** *If the air pump is not functioning, the scale can be raised using the auxiliary fill directly below the dump valve.*

12. Place shims directly under the base frame, under the load cell stands, to prevent teetering (see Figure 3-4).
13. Open the dump valves to lower the scale onto the ground and shims.

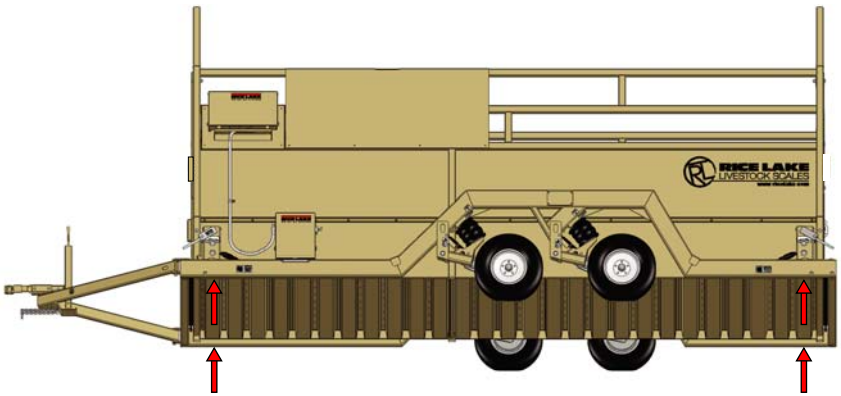



*Figure 3-4. Shimming Locations*

14. Unpin the hitch and swing both hitch halves clear.

Note ***The hitch sections can be removed. To remove the hitch, remove the pins from the scale end of the hitch arms, and pull all wiring through the driver's hitch tube.***

15. ***USING BOTH HANDS***, raise the platform (rotate cam handle in direction indicated by decal) to enable the scale (see Figure 3-5).

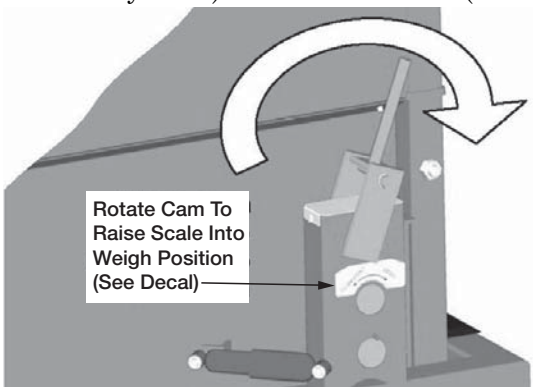



*Figure 3-5. Scale Lift*

WARNING ***The lift mechanism is an over center cam style lift and lock. If not disturbed, the scale will remain "locked" in the up (weigh) position. Always grip lift handle with two hands when raising and lowering the scale.***

Note ***Cam levers point toward each other in weigh mode and away from each other in transport. See decals for direction of levers in each mode.***

16. Ensure the weigh center power switch is in the ON position. Verify the indicator does not show out of level. If it does, shim the scale as necessary (see steps 11-13 above).
17. The weigh indicator should be powered up. The readout of GROSS weight on the indicator should be near zero (within four percent of the scale capacity). If it is not, ensure the scale is fully lifted and that there is no debris on or under the scale.

*Figure 3-6. Scale in Weigh Mode*

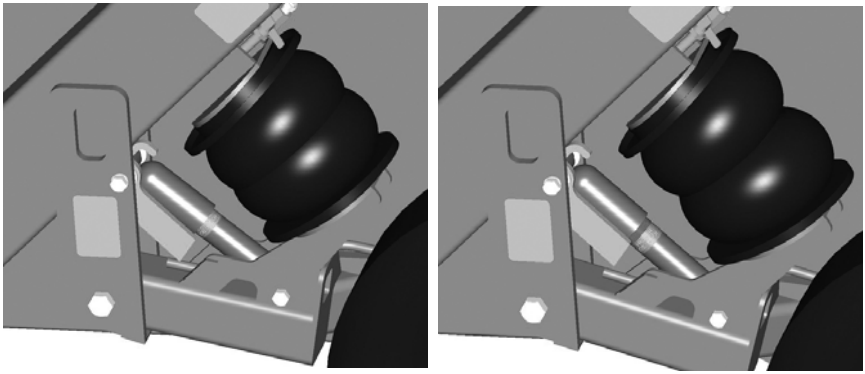
### 3.1.2 Converting to Transport Mode

1. Turn OFF the power switch located in the weigh center. Close and latch the weight center cover.
2. **USING BOTH HANDS** lower the platform (rotate the cam handles in the direction indicated by decal) to disengage the scale. Ensure the handles are in the fully locked position.

**WARNING** ***The lift mechanism is an over center cam style lift and lock. If not disturbed the scale will remain "locked" in the up (weigh) position. Always grip lift handle with two hands when raising and lowering the scale.***

**Note** ***Cam levers point toward each other in weigh mode and away from each other in transport. See decals for direction of levers in each mode.***

3. Swing the hitch halves together and pin. Ensure the hitch pins have the safety pins installed.
4. Add air to the scale suspension so that the frame rises evenly off the ground to the correct ride height of approximately 8 inches (as indicated by the ride height labels on the shock absorbers). Use either compressor on scale or a remote compressor connected to the auxiliary air fill.



Proper Ride Height  Over Inflated

*Figure 3-7. Scale Suspension*

5. Close all the air valves. During scale towing, all valves MUST be closed.

**Note** ***After connecting to the tow vehicle you must operate the valves again.***

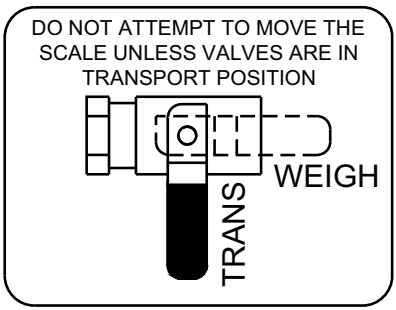



*Figure 3-8. Air Valve Position*

6. Flip the suspension stops into the transport position.

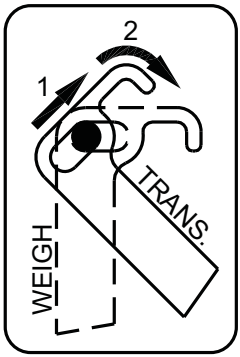



*Figure 3-9. Transport Position*

7. Extend the jack so the scale hitch rises off the ground.
8. Position the truck near the scale hitch.
9. Connect the scale to the truck and connect all wiring.
10. CONNECT SAFETY CHAINS.
11. Connect equalizer hitch if desired.
12. Retract the jack.
13. Recheck the ride height of the scale and adjust as indicated on the ride height labels on the shock absorbers. (See step 4 on page 22)

**Note**

***For Tandem Axle Scales:***
***Once the scale is connected to the tow vehicle and the ride height has been set, with the dump valve closed, open the valves on the front and rear axle to allow the pressure to equalize. Repeat for each side of the scale. Close the valves before transporting the scale.***

**WARNING**

***Do not move the vehicle until the scale is in the locked transport position, all air valves are closed, the jack is retracted and the drop leg pin is installed, the suspension stops are in transport position, and the safety chains are attached.***

*Figure 3-10. Scale in Transport Mode*

# 4.0 Repair Parts

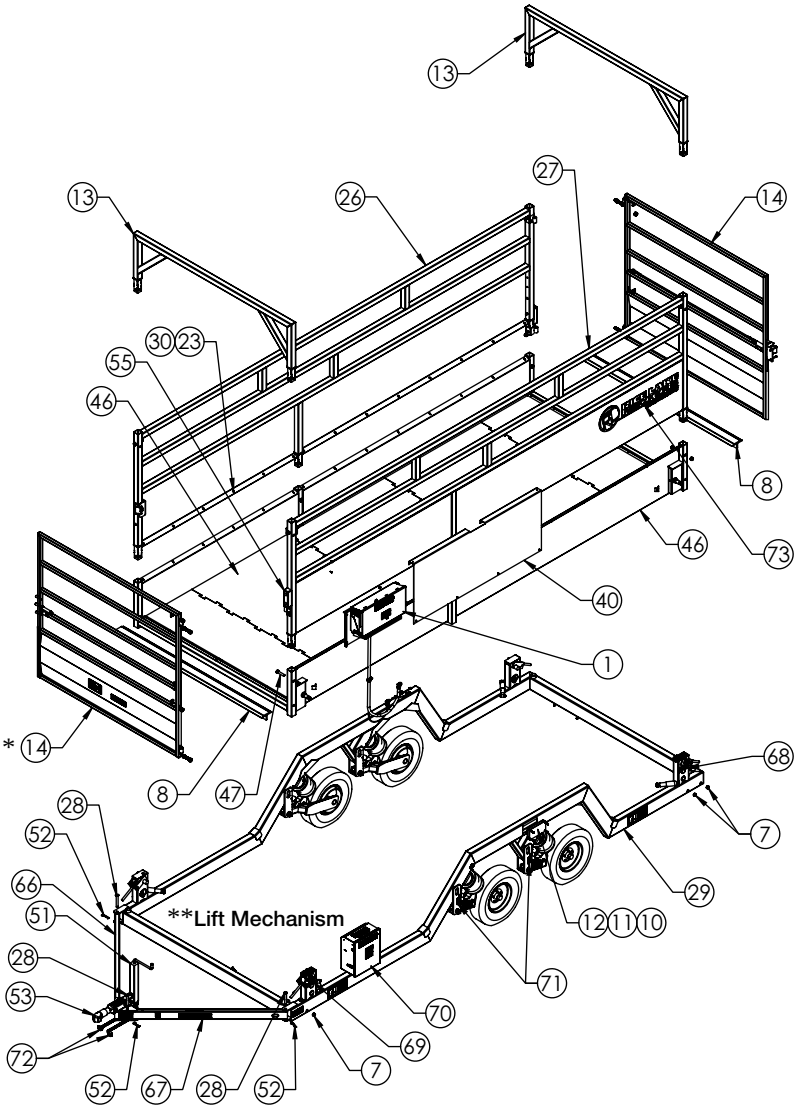



*Figure 4-1. MAS-M*

*See Figure 4-2 Details A-D for gate hardware (item 14).
**See Figure 4-2 Detail E for lift mechanism parts.

| Key | Part No. | Description |
|---|---|---|
| 1 | 131436 | Weigh Center w/ Indicator (see Operator's manual PN 159192) |
| 7 | 126788 | Plug Plastic Round 1-1/8" |
| 8 | 126787 | Scale T-belting (83" width) |
| 10 | 127740 | Cover Plate Scale Frame/J-box |
| 11 | 126819 | Foam Gasket J-box |
| 12 | 131891 | Scale Junction Box 4 Cell SS |
| 13 | 130931 | Cage Cross-member |
| 14 | 131782 | Gate Short Sheeted |
| 23 | 126951 | Bolt Carriage 5/16 x 1/2 Round Head Grade A Zinc |
| 26 | 131708 | Cage Wall 13' |
| | 131946 | Cage Wall 18' Right |
| 27 | 131708 | Cage Wall 13' |
| | 131947 | Cage Wall 18' Left |
| 28 | 127168 | Pin, Hitch Pivot |
| 29 | 130567 | Frame, 13' |
| | 130773 | Frame, 18' |
| 30 | 126950 | Nut 5/16 Flanged Serrated |
| 40 | 130022 | Operator Shield |
| | 45728 | Screw, Self Drilling 12-24 x 7/8 |
| 46 | 131707 | Cage Floor MAS-M, 13' |
| | 131934 | Cage Floor MAS-M, 18' |
| 47 | 15097 | Bolt, 3/4-10NC x 3 1/2 Hex Head, Grade 5 Zinc |
| | 14697 | Nut, Lock, 3/4-10NC Hex, Nylon Insert Zinc |
| 51 | 127716 | Jack w/ Drop Leg and Mount |
| 52 | 126966 | Hair Pin |
| 53 | 127715 | Hitch Coupler Mobile MAS |
| 55 | 106387 | Bumper |
| 66 | 131896 | Hitch Member Right |
| 67 | 131900 | Hitch Member Left |
| 68 | 132692 | Label MAS-M Weigh/Transport Mode |
| 69 | 127094 | Label MAS-M Transport/Weigh Mode |
| 70 | 127721 | Battery Box w/ compressor and wiring |
| 71 | 127098 | Transportation Position Decal |
| 72 | 131955 | Safety Chain |
| 73 | 130842 | Rice Lake Decal |
| N/S | 127727 | Standard Hitch Cable w/Connectors |
| N/S | 127090 | Label Basic Operating Instructions |

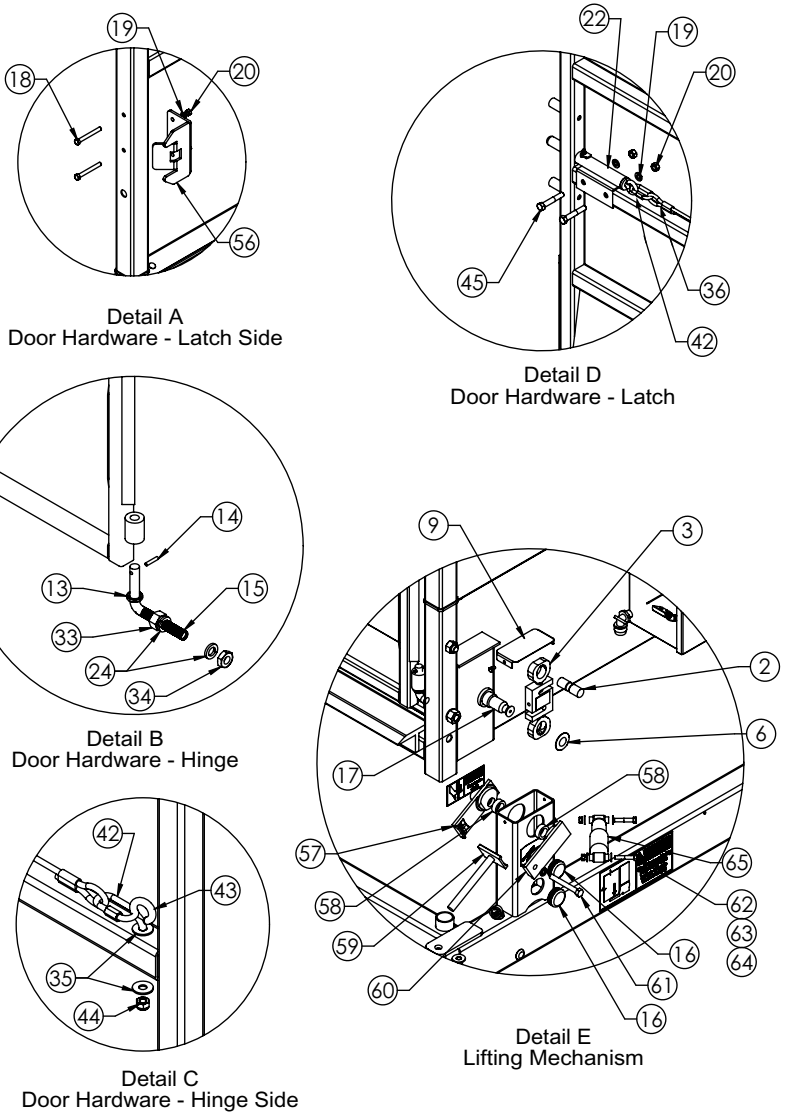



*Figure 4-2. MAS-M Details*

| Key | Part No. | Description |
|---|---|---|
| 2 | 127184 | Upper Notched Load Cell Pin |
| 3 | 21444 | Load Cell S-Type 10K |
| | 127163 | Eyebolt Machined 10K |
| 6 | 127668 | Lower Load Cell Retainer |
| 9 | 127200 | Load Cell Cam Stand Cover SS |
| | 127007 | Bolt 1/4x1/2 |
| 13 | 151807 | Washer, Plain 3/4in Nylon |
| 14 | 110950 | Pin, Spring 1/4 x 1 1/4 |
| 15 | 151589 | Hinge Hanger Bolt Hook |
| 16 | 127684 | Plug Plastic Round 2” |
| 17 | 127177 | Lower Notched Load Cell Pin |
| | 126926 | Pin Spring Slotted 1/4x2-1/4 |
| 18 | 127033 | Cap Screw, 3/8-16 x 3/4 |
| 19 | 15159 | Washer, 3/8 Lock |
| 20 | 132684 | Nut, 3/8-16 Grade5 |
| 22 | 131784 | Gate Latch |
| | 127021 | Hair Pin 1/8 x 2 9/16 |
| 24 | 15181 | Washer, 3/4 |
| 31 | 132179 | Hinge Bracket |
| 33 | 111074 | Nut, 3/4-10NC |
| 34 | 132217 | Jam Nut, 3/4-10NC |
| 35 | 21939 | Washer, 5/16 |
| 36 | 131886 | Cable, 1/4” OD x 6 ft |
| 37 | 71872 | Bolt, 3/4-10NC x 4 |
| 39 | 14697 | Nut, Lock 3/4-10NC |
| 42 | 131887 | Quick Link 1/4 in |
| 43 | 131701 | Eye Bolt, 5/16-18 x 2 1/2 |
| 44 | 14646 | Nut, Lock 5/16-18NC |
| 45 | 39528 | Bolt, 3/8-16NC x 2 1/4 |
| 56 | 132427 | Strike Plate |
| 57 | 131787 | Cam with Lockdown |
| 58 | 127165 | Spacer Upper Notched Pin |
| 59 | 127732 | Cam Handle |
| 60 | 131785 | Cam Without Lockdown |
| 61 | 15167 | Lockwasher ½ |
| | 14765 | Bolt 1/2 x 4 |
| | 127561 | Scale Cable Female MS Conn 132” |
| 62 | 22093 | Bolt 3/8 x 2 Grade5 |
| 63 | 15161 | Flat washer 3/8 SS SAE |
| 64 | 126992 | Nut 3/8 SS |
| 65 | 128626 | Scale Damper Assembly w/Bushings |

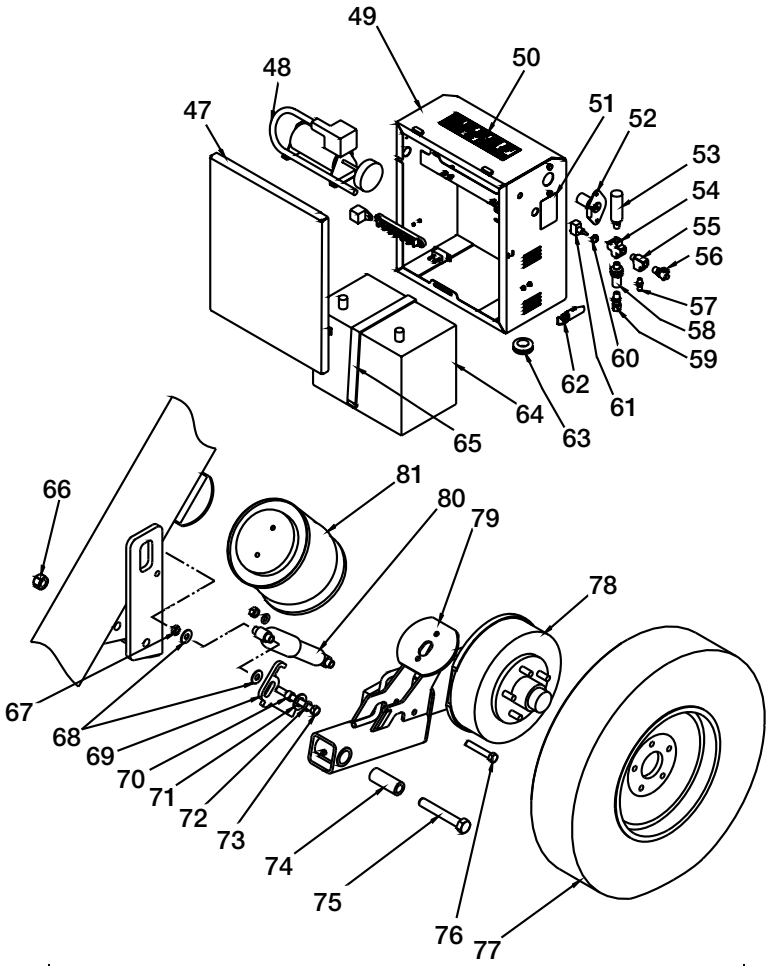



*Figure 4-3. Battery Box and Tire/Wheel Parts*

| Key | Part No. | Description |
|---|---|---|
| 47 | 127171 | Door Assembly Battery Box |
| 48 | 127414 | Air Compressor 12V, 1 CFM |
| 49 | 127170 | Battery housing |
| 50 | 128266 | Label “Not for Transportation ….” |
| 51 | 131015 | Label Hitch Plug Wiring |
| 52 | 127393 | 6 Way Round Trailer Receptacle |
| 53 | 127406 | Relief Valve Air 150 PSI |
| 54 | 126900 | 4FP Brass Cross |

| Key | Part No. | Description |
|---|---|---|
| 55 | 127070 | Brass Tee Forger 4FP |
| 56 | 126891 | Valve Brass Drain Cock |
| 57 | 127399 | Valve Air Tank w/ Core and Cap |
| 58 | 126901 | Fitting Brass 4FP Terminal Bolt |
| 59 | 126902 | Fitting Brass 4MP to ¼ Synflex |
| 60 | 128108 | Switch Seal Hex |
| 61 | 127398 | Switch ON/OFF |
| 62 | 127289 | Latch SS Pull Up |
| 63 | 126944 | Grommet 1-3/8 x 1/4 |
| 64 | 127106 | Battery Deep Cycle Marine |
| | 127402 | Terminal Block 6 Pole |
| | 127397 | Relay Headlight 12v |
| | 127076 | Circuit Breaker 12V 30 Amp |
| 65 | 127073 | Strap 1" with Clasp |
| 66 | 14697 | Nut Lock Nylon ¾ |
| 67 | 126936 | Nut Jam ½ |
| 68 | 127046 | Washer 7/16 USS |
| 69 | 127334 | Suspension Stop Arm |
| 70 | 127178 | Bushing Suspension Stop |
| 71 | 15179 | Washer ¾ SAE |
| 72 | 15167 | Lock washer ½ |
| 73 | 14768 | Bolt ½ x4-1/2 |
| 74 | 127169 | Bushing Pivot Axle |
| 75 | 14788 | Bolt ¾ x 5 |
| 76 | 14757 | Bolt ½ x 3 |
| 77 | 127129 | Tire and Rim ST175/80R13 |
| 78 | 132389 | Hub and Drum, Dexter 3500# Axle w/ 10x2.5 Brakes |
| | 132387 | Left Dexter 3500# Axle w/ 10x2.5 Brakes |
| | 132388 | Right Dexter 3500# Axle w/ 10x2.5 Brakes |
| 79 | 127718 | Axle Arm Left |
| | 127719 | Axle Arm Right |
| 80 | 127745 | Suspension Shock Absorber |
| 81 | 127405 | Air Spring 2B8-550 |
| | 127069 | Ball Valve, Miniature |
| | 82133 | Nipple, Pipe 1/4NTP x 3 |

# 5.0 Maintenance

## 5.1 Maintenance Schedule

### Before Each Use

1. Grease axle pivot locations, using the provided grease zerks (see Figure 5-1), using a “Black Moly” type grease.

### First Week

1. Check torque on all wheel nuts (see Section 5.3.4 on page 33).

### Weekly

1. Check entire scale for buildup of debris. Remove any debris found on, under or around the scale. Rubber T-belting at both ends of the scale are removable to make clean out easier. To remove T-belting, unhook the stretch cord that hooks into the corner tube of the cage.
2. Check for dirt and debris in the load cell stands and clean accordingly.
3. Check all external cables and conduit for damage.

### First Month (in addition to weekly maintenance)

1. Check torque on all wheel nuts (see Section 5.3.4 on page 33).
2. Adjust scale brakes.

### Monthly (in addition to weekly maintenance)

1. Charge scale battery if necessary.
2. Tire Pressure. 45 psi./40psi. - Single /Tandem Axle
3. Grease gate latch zerks (see Figure 5-1) using a “Black Moly” type grease.

### Yearly (in addition to weekly and monthly maintenance)

1. Check and grease wheel bearings (see Section 5.3.5 on page 33).
2. Disassemble each load cell location and grease all pins and eye bolts (see Section 5.2.2 on page 31).
3. Adjust scale brakes (see Section 5.3.3 on page 32).

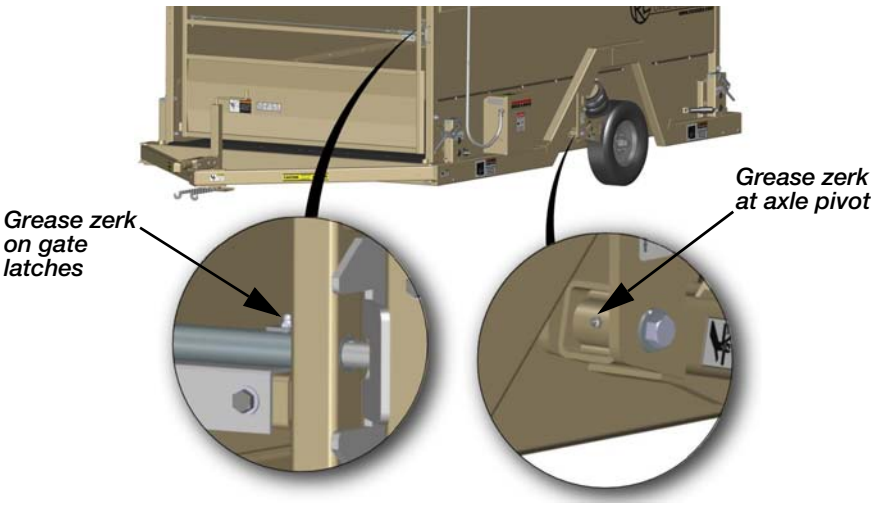



*Figure 5-1. Grease Zerk Locations*

# 5.2 Scale Maintenance Procedures

## 5.2.1 Cleaning Load Cell Stands

It is very important to keep any excess debris from building up in the load cell stand. Lift scale and block it up, clean any dirt out of the load cell stands through the drain holes located at the bottom of the stand.

## 5.2.2 Disassembly and Greasing

This is very important to ensure the long life of the unit. Use the parts list drawings for item numbers.

***Use quality high-pressure grease.***
***Avoid bending or twisting the load cell wires.***

a. Remove the cell stand cover (27).
b. Remove the plug covers (34)
c. Remove the bolt which holds together items 26, 39, 38.
d. While holding the cam handle (36), remove the outer cam (38).
e. Remove the load cell pin (37) and spacers (35). The load cell assembly will be free on top and rest against the inside of the cell stand.
f. Remove the inner cam (26).
g. Remove the lower retainer (33)
h. Grease all bearing surfaces except where the eyebolt contacts the pin (upper and lower pins, cams, upper and lower eyebolts).
i. Reassemble in reverse order as described above.

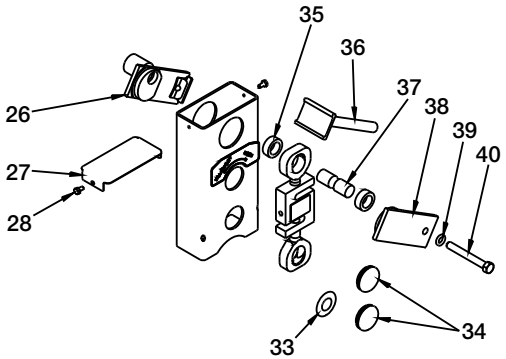



*Figure 5-2. Disassembly and Greasing*

# 5.3 Scale Maintenance Procedures

## 5.3.1 How to Use The Electric Brakes Properly

The scale brakes are designed to work in synchronization with the tow vehicle brakes. Never use the tow vehicle or scale brakes alone to stop the combined load.

The brake controller must be set up according to the manufacturer's recommendations to ensure proper synchronization between the tow vehicle and the scale. Additionally, you may have to make small adjustments occasionally to accommodate changing loads and driving conditions.

Proper synchronization of tow vehicle to scale braking can only be accomplished by road testing. Brake lockup, grabbing, or harshness is quite often due to the lack of synchronization between the tow vehicle and the scale being towed, too high of a threshold voltage (over 2 volts), or under adjusted brakes.

***The following should only be performed in a safe environment such as an unpopulated road free of traffic or under controlled conditions.***

Before any synchronization adjustments are made, the scale brakes should be burnished-in by applying the brakes 20-30 times with approximately a 20 m.p.h. decrease in speed, e.g. 40 m.p.h. to 20 m.p.h. Allow ample time for brakes to cool between application. This allows the brake shoes and magnets to slightly "wear-in" to the drum surfaces.

## 5.3.2 Synchronizing The Scale Brakes

To ensure safe brake performance and synchronization, read the brake controller manufacturer's instructions completely before attempting any synchronization procedure.

Make several hard stops from 20 M.P.H. on a dry paved road free of sand and gravel. If the scale brakes lock and slide, decrease the gain setting on the controller. If they do not slide, slightly increase the gain setting. Adjust the controller just to the point of impending brake lockup and wheel skid.

***Not all scale brakes are capable of wheel lockup. Loading conditions, brake type, wheel and tire size can all affect whether a brake can lock. It is not generally considered desirable to lock up the brakes and slide the tires. This can cause unwanted flat spotting of the tires and could also result in a loss of control.***

If the controller is applying the scale brakes before the tow vehicle brakes, then the controller adjustments should be made so the scale brakes come on in synchronization with the tow vehicle brakes. For proper braking performance it is recommended that the controller be adjusted to allow the scale brakes to come on just slightly ahead of the tow vehicle brakes. When proper synchronization is achieved there will be no sensation of the scale “jerking” or “pushing” the tow vehicle during braking.

## 5.3.3 Brake Adjustment

Brakes should be adjusted (1) after the first 200 miles (first month) of operation when the brake shoes and drums have “seated,” (2) at 3,000 mile intervals (or yearly), (3) or as use and performance requires. The brakes should be adjusted in the following manner:

1. Jack or block the axle arm to allow free rotation of the wheel.
2. Remove the adjusting hole cover from the adjusting slot on the bottom of the brake backing plate.

3. Rotate the star wheel of the adjuster assembly with a screwdriver or standard adjusting tool to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.
4. Then rotate the star wheel in the opposite direction until the wheel turns freely with a slight lining drag.
5. Replace the adjusting hole cover and lower the wheel to the ground.
6. Repeat the above procedure on all brakes. For best results the brakes should all be set at the same clearance.

### 5.3.4 Wheel Assembly and Torque Specification

1. Start all bolts or nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in the sequence shown below.
3. The tightening of the fasteners should be done in stages, per torque chart below following the recommended sequence.
4. Wheel nuts/bolts should be torqued before first road use and after each wheel removal. Check and re-torque after the first 10 miles, 25 miles, and again at 50 miles.

| 1st Stage | 2nd Stage | 3rd Stage |
|---|---|---|
| 20-25 | 50-60 | 90-120 |

*Table 5-1. Wheel Torque Sequence (ft-lbs)*

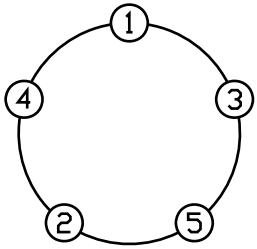



*Figure 5-3. Wheel Torque Sequence*

### 5.3.5 Bearing Adjustment

In the event the hub is removed follow this procedure for wheel bearing adjustment.

1. After placing the hub, bearings, washers, and spindle nut on the axle spindle rotate the hub assembly slowly while tightening the spindle nut to approximately 50 lbs.-ft.
2. Then loosen the spindle nut to remove the torque. Do not rotate the hub.
3. Finger tighten the spindle nut until just snug.
4. Back the spindle nut out slightly until the first castellation lines up with the cotter key hole and insert the cotter pin
5. Bend over the cotter pin legs to secure the nut.
6. The nut should be free to move with the only restraint being the cotter pin.
7. Install the dust cover and rotate the wheel to ensure the cotter key does not contact the dust cover.

### 5.3.6 Axle Parts

Axles are Dexter 3500lb, 5-bolt with 10x2-¼" brakes.

Following are replacement parts available from Dexter.

| Bearings | | |
|---|---|---|
| | **Dexter Kit #** | **Industry Part # Cup/Cone** |
| Inner | K71-390-00 | L68111 / L68149 |
| Outer | K71-306-00 | L44610 / L44649 |

| **Description** | **Dexter Part #** |
|---|---|
| Inner Bearing Seal | 010-004-00 |
| Magnet | K71-104-00 |
| Brake Shoe and Lining | K71-047-00 |
| Brake Assembly LH | 023-026-00 |
| Brake Assembly RH | 023-027-00 |
| Hub | 008-247-05 |

## 5.4 Gathering Panel Attachment

Suggested Construction

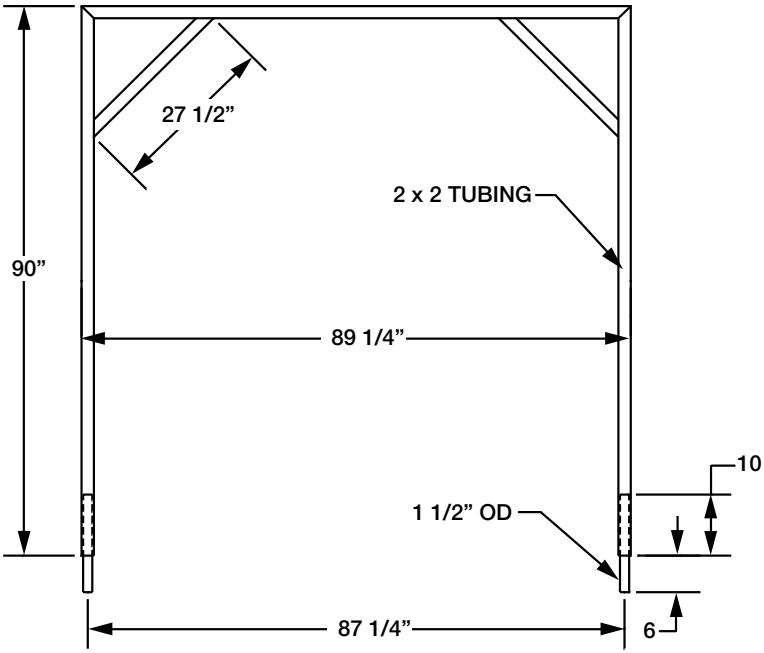



*Figure 5-4. Gathering Panel Frame*

Building a simple framework that can be set into the provided scale posts can accommodate mounting of most any panel. In some cases extra support of the mounting frame may be required.

Figure 5-4 shows the suggested construction of a framework you can build to support the type of gathering panels you have. Some gathering panels can be set directly into the corner posts located on the corners of the scale and require only a shortened version of the drawing above that can be set into the top of the panels. (See Figure 5-5) However, with the wide variety of panels available we cannot provide a mounting means for all of them.

However you decide to mount you panels you must ensure the panels or framework are not attached to the scale cage and must have a clearance of 1" from any live portion of the scale. Any contact between the panels or framework and the scale can cause the weight reading to be inaccurate.

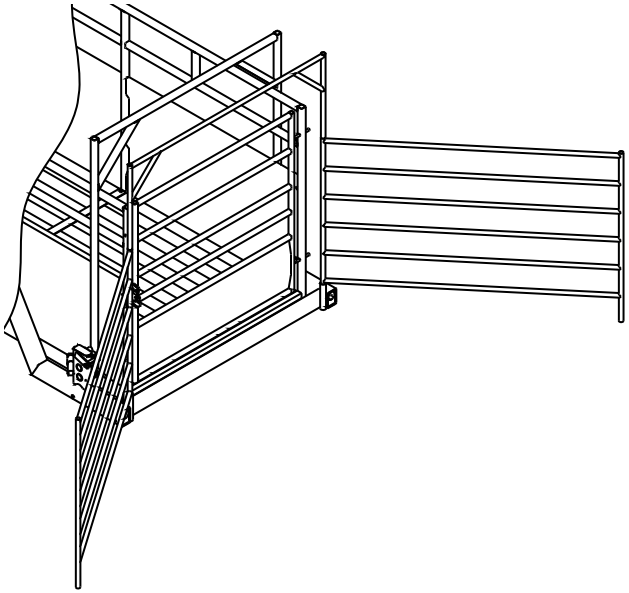


*Figure 5-5. Gather Panel Attachment*

**CAUTION**

***Gathering Panel Warranty Information***

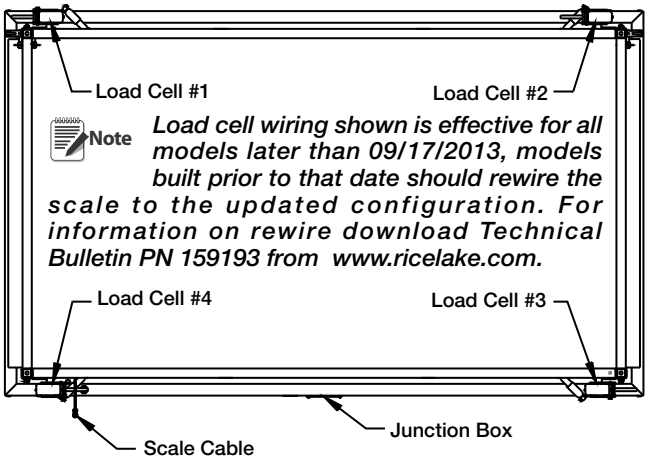
***Gathering panels or handling attachments must be removed from the scale during transport. The scale is not intended for the transportation of goods or livestock.***

***The design of the scale only allows for 100 pounds to be added to either end of the scale, for a MAXIMUM addition of 200 pounds, during transport. All attachments that will remain on the scale must not exceed the weight limit of 100 pounds on the front and/or 100 pounds on the rear. If the total of the attachments on either the front or the rear exceeds 100 pounds the warranty will be void.***

***Any additions to the scale may affect the balance and towability of the scale.***

***Any attachments to the scale must be secured during transport and not interfere with any safety device or the operation scale mechanisms.***

## 5.5 Wiring Diagrams


Load Cell #1
Load Cell #2
Note
Load cell wiring shown is effective for all models later than 09/17/2013, models built prior to that date should rewire the scale to the updated configuration. For information on rewire download Technical Bulletin PN 159193 from www.ricelake.com.
Load Cell #4
Load Cell #3
Scale Cable
Junction Box

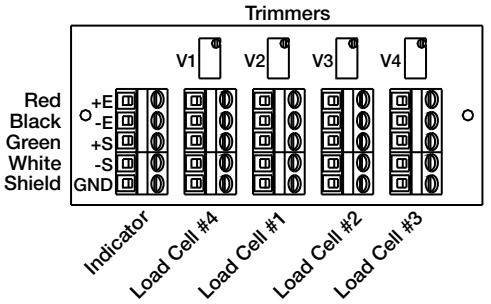



*Figure 5-6. Load Cell Wiring Diagram*

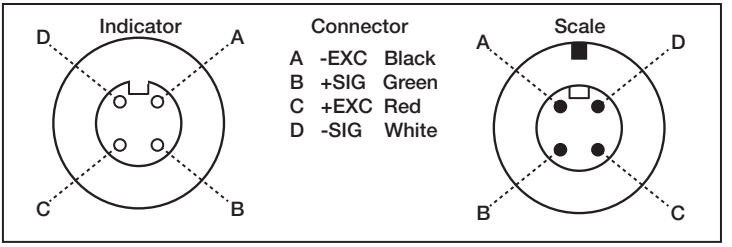



*Figure 5-7. Scale/Indicator System Connection*

### 7 WAY TRAILER CONNECTOR

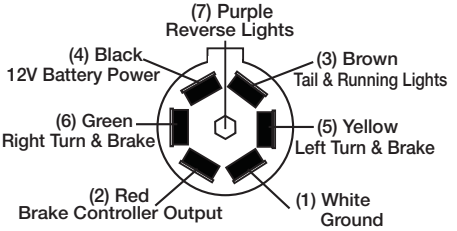



*Figure 5-8. Electrical Connection*

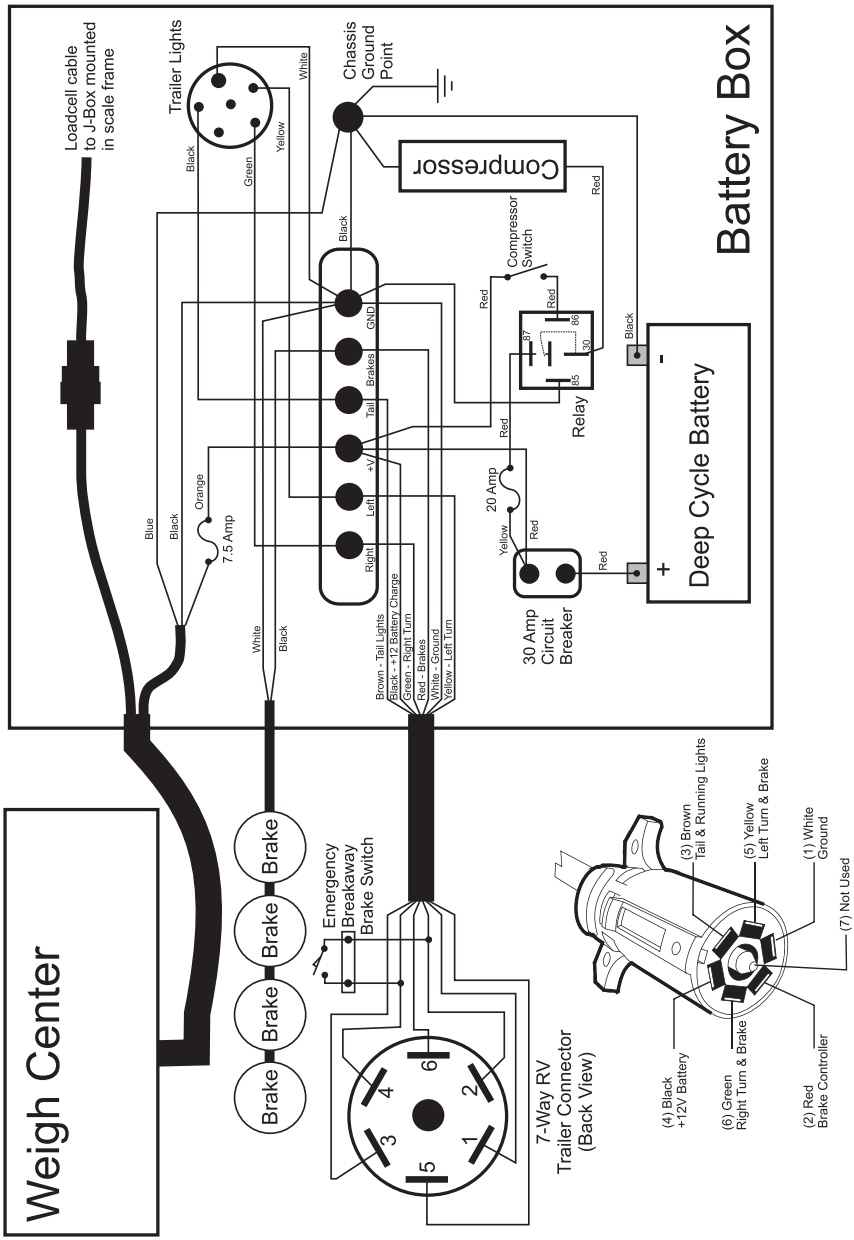



*Figure 5-9. System Wiring Diagram*

## 5.6 Specifications

Size / Model # _____

Serial # _____

Date Purchased _____

Unit ID # _____

| | MAS8-13 | MAS8-18 |
|---|---|---|
| Length Overall | 18’-8” | 24’-5” |
| Length Deck | 12’-9” | 18’-6” |
| Width Overall | 8’-6” | 8’-6” |
| Width Deck | 7’-5” | 7’-5” |
| Deck Height | 6” | 6” |
| Height | 99” | 99” |
| Deck Covering | 5/8” Recycled Molded Rubber Flooring System | |
| Weight | 3100 lbs. | 4600 lbs. |
| Capacity | 15000 lbs. | 20000 lbs. |
| Section Cap | 10000 lbs. | 20000 lbs. |
| Approval Class | IIIL (IIIHD) | IIIL (IIIHD) |
| Approvals | 99-091A4 | AM4* |
| Grad Size | 5 lb (2 kg) | 5 lb (2 kg) |
| **Paint | Powder Coated Galvanized Steel | |
| Tire Pressure | 50 PSI | 45 PSI |
| Wheel size | 13” 5 on 4.5” | 13” 5 on 4.5” |
| Tire Size | ST175/80R13 | ST175/80R13 |
| Lug Torque | 90-120 ft-lbs | 90-120 ft-lbs |
| Battery | 12V Deep Cycle | 12V Deep Cycle |
| **Structural Steel is not galvanized. | | |

## 5.7 Towing Checklist

Each item of checklist to be reviewed and list to be signed by dealer and customer at delivery.

- [ ] Operator Safety section of manual has been reviewed.
- [ ] Scale is not intended for the transport of livestock or any other goods or materials.
- [ ] Ball on towing vehicle must be 2”
- [ ] Hitch height of towing vehicle must be between approximately 16” above the ground such that the scale is in towing level.
- [ ] Safety chains must always be connected during towing.
- [ ] Towing vehicle must be wired correctly (see label on hitch)
- [ ] Magnetic lighting package must be on the scale during towing.
- [ ] Scale is equipped with electric brakes and must be synchronized. See synchronization procedure in manual.
- [ ] Scale is designed to be towed at a ride height indicated by labels on the suspension shock absorbers. Towing at ride heights outside of the indicated range may result in suspension damage.
- [ ] Suspension stops must be in the transport position during towing.
- [ ] Converting the scale from weigh mode to transport mode and back to weigh mode has been reviewed.
- [ ] Safety pins are installed in all the hitch pins.
- [ ] Dexter recommends to re-torque wheel lug nuts at 10, 25 and 50 miles.

Buyer _____Date_____

Dealer _____

Copy to be retained by dealer

Fax copy to manufacturer: Fax #: 715-234-6967

# Mobile Group Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for two years.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, *Protecting Your Components From Static Damage in Shipment*, available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

**THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

**RLWS AND BUYER AGREE THAT RLWS' SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.**

**SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.**

**NO TERMS, CONDITIONS, UNDERSTANDING, OR AGREEMENTS PURPORTING TO MODIFY THE TERMS OF THIS WARRANTY SHALL HAVE ANY LEGAL EFFECT UNLESS MADE IN WRITING AND SIGNED BY A CORPORATE OFFICER OF RLWS AND THE BUYER.**

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RICE LAKE, WISCONSIN 54868 • USA

# For More Information

## Web Site

Frequently Asked Questions (FAQs) at

http://www.ricelake.com/faqs.aspx

## Contact Information

### Hours of Operation

Knowledgeable customer service representatives are available 6:30 a.m. - 6:30 p.m. Monday through Friday and 8 a.m. to 12 noon on Saturday. (CST)

### Telephone

- Sales/Technical Support 800-472-6703
- Canadian and Mexican Customers 800-321-6703
- International 715-234-9171

### Immediate/Emergency Service

For immediate assistance call toll-free 1-800-472-6703 (Canadian and Mexican customers please call 1-800-321-6703). If you are calling after standard business hours and have an urgent scale outage or emergency, press 1 to reach on-call personnel.

### Fax

Fax Number 715-234-6967

### E-Mail

- US sales and product information at

  prodinfo@ricelake.com
- International (non-US) sales and product information at

  intlsales@ricelake.com

### Mailing Address

Rice Lake Weighing Systems
230 West Coleman Street
Rice Lake, WI 54868 USA

# Notes

RICE LAKE®
WEIGHING SYSTEMS
To be the best by every measure®

230 W. Coleman St. • Rice Lake, WI 54868 • USA
U.S. 800-472-6703 • Canada/Mexico 800-321-6703 • International 715-234-9171 • Europe +31 (0) 88 2349171

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